

Josh Jarrell, PhD, PMP

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Summary

High-performing nuclear engineer with proven technical and project leadership skills. Experience coordinating and managing multiple organizations to deliver high-quality deliverables to sponsors, communicating with external and internal stakeholders, and developing project goals and achieving these goals. Expertise developing and implementing radiation transport computational methods, reviewing laboratory proposals, publishing and presenting politically sensitive results, and working with a large, geographically-diverse team to achieve results.

Areas of expertise include:

- Project Management
- Team Leadership
- Public Speaking
- Written Communication
- Stakeholder Communication
- System Analyses
- Radiation Transport
- Computational Methods
- Spent Nuclear Fuel Management

Professional Experience

Oak Ridge National Laboratory, UT-Battelle, Oak Ridge, TN

Research and Development Staff, Used Fuel Systems Group 2013 - present
Research and Development Staff, Radiation Transport Group 2010 - 2013

Roles and Responsibilities

- 2015 – present *Strategic Crosscuts Control Account Manager, DOE-NE Nuclear Fuels Storage & Transportation Planning Project (NFST)*
Responsible for managing staff and contractors from 5 National Laboratories engaged in NFST activities related to project management, waste management systems analysis, data and document access, standardization and integration, spent fuel characterization and assessment, and communication products (FY15 funding of ~\$5M at ORNL, ~\$10M at other labs and contractors).
- 2015 – present *R&D Staff, DOE-EM Universal Canister Project*
Responsible for maintaining integration as point of contact for ORNL for the universal canister project led out of SNL. Responsibilities include coordination, conceptual design of canister system, sponsor and customer feedback and interaction, and development of a number of technical reports related to the potential HLW that would be compatible with a universal canister concept.

- 2014 – present *Standardization and Integration and Systems Analysis Work Packages Manager, NFST*
 Lead multi-laboratory team to evaluate integration of standardization in the back-end of the nuclear fuel cycle from a complete system perspective (FY15 funding of ~\$1M at ORNL, ~\$2M at other labs and contractors). Lead system analysis related to incorporating interim storage into the waste management system and was point of contact for ORNL in other systems analysis related to the waste management system (FY15 funding of ~\$1M at ORNL).
- 2015 – present *University Coordinator, ORNL – Reactor and Nuclear Systems Division*
 Develop and implement the division’s strategy for attracting high-performing students, post-docs, and early career staff. This role includes developing the division strategic vision for university recruitment as well as coordinating recruiting activities between the division staff (~125), external speakers, web-designers, university staff, and students.
- 2014 – 2015 *Seed Committee Member, ORNL*
 Review written Seed proposals and evaluate presentations of those proposals. This committee performs monthly review of six to eight proposals requesting up to \$190K each.
- 2013 – 2014 *Data and Document Access Work Package Manager, NFST*
 Initiated and managed the Centralized Used Fuel Resource for Information Exchange (CURIE, curie.ornl.gov) website for data and document access (~\$400K/year at ORNL).
- 2010 – 2013 *Research and Development Staff, Radiation Transport Group*
 Major contributor to the design, implementation, and maintenance of ORNL’s deterministic transport code, Denovo, including: development and implementation of two-dimensional capabilities, advanced quadrature sets, and method of characteristics solver, as well as support for reactor model development for the Consortium for Advancement Simulation of Light Water Reactors. Developed and won a Seed proposal to lead a small team to migrate the method of characteristics approach from CPUs to GPUs (\$190K).

Education

- 2010 **Ph.D., Nuclear Engineering**
Texas A&M University, College Station, TX
 Dissertation: “An Adaptive Angular Discretization for Neutral Particle Transport in Three-Dimensional Geometries”
- 2006 **B.S., Nuclear Engineering**
Texas A&M University, College Station, TX
 Minor in Mathematics

Awards and Certificates

- 2015 Project Management Institute Project Management Professional Certification
- 2012 ORNL Significant Event Award, *Completion and Delivery of Version 2.0 Virtual Environment for Reactor Applications (VERA)*

Technical Skills

- Advanced Microsoft Office, C++, C, MATLAB, LaTeX

Experienced Microsoft Project, SmartSheet, UNF-ST&DARDS, Python, Fortran, Tecplot, Maple, XML, MPI, CUDA, VisIt, Trilinos, MCNP, PARTISN, Denovo, SCALE

Internships and Research

2008 **Rickover Fellow**

Lockheed Martin, Knolls Atomic Power Laboratory (KAPL), Schenectady, NY
Implemented multiple quadrature regions into the KAPL deterministic radiation transport code, Jaguar. Added additional quadrature sets to the Jaguar.

2007 **Rickover Fellow**

Bechtel, BETTIS Atomic Power Laboratory, West Mifflin, PA
Produced advanced quadrature sets using MATLAB routines for use in PARTISN. Analyzed existing quadrature accuracy for difficult shielding problems.

2006 **Intern, Reactor Physics Group**

Westinghouse/TXU, Dallas, TX
Worked with Westinghouse engineers in order to determine guidelines for Comanche Peak for core configurations to minimize potential crud induced power shifts using the BOA code. Ran SIMULATE code to analyze past, current, and future Comanche Peak fuel cycles. Ran VIPRE code to perform sensitivities on different heat transfer correlations.

2005 **Intern, Space Power Propulsion Group**

Lockheed Martin, Knolls Atomic Power Laboratory, Schenectady, NY
Analyzed KAPL Monte Carlo codes in relation to International Benchmarks. Documented conversion procedures of MCNP inputs into KAPL code inputs, including common MCNP mistakes. Designed preliminary space reactor cores.

2004-2005 **Student Researcher, Nuclear Engineering Department**

Texas A&M University, College Station, TX
Tested and validated inputs for the massively parallel deterministic transport code, PDT.

2004 **Student Research Grant Recipient, Nuclear Engineering Department**

Texas A&M University, College Station, TX
Worked to improve efficiency of PDT using LLNL super-computers. Developed and implemented more efficient parallel processor layouts in three dimensions geometries.

Refereed Publications

J. J. Jarrell, R. A. Joseph III, Riley M. Cumberland, G. M. Petersen, J. Fortner, E. Kalinina, T. Severynse, "An Evaluation of Standardized Canisters in the Waste Management System," *Proc. WM2016*, Phoenix, AZ, March 6-10, 2016 (submitted).

A. A. Alsaed, J. A. Blink, J. J. Jarrell, R. L. Howard, E. L. Hardin, C. R. Bryan, "Performance Specifications for Standardized Transportation, Aging, and Disposal Canister Systems," *Proc. ANS Winter Meeting*, Washington, D.C., November 8 - 12, 2015.

J. Jarrell, R. Joseph III, J. Fortner, R. Hale, R. Howard, E. Kalinina, G. Petersen, R. Wilkerson, "Initial Evaluation of Standardized Canisters in the Waste Management

System," *Proc. ANS International High-Level Radioactive Waste Management Conference*, Charleston, SC, April 12 – 16, 2015.

R. Cumberland, J. Jarrell, R. Howard, J. Williams, "A Review of Multipurpose Canister Concepts for Standardization in the Waste Management System," *Proc. Waste Management 2015*, Phoenix, AZ, March 15 – 20, 2015.

W. Nutt, J. Wagner, M. Feldman, J. Carter, R. Howard, J. Jarrell, "Nuclear Fuel Storage and Transportation Planning Project Strategic Crosscutting Activities," *Proc. Waste Management 2015*, Phoenix, AZ, March 15 – 19, 2015

M. Jessee, W. Wieselquist, T. Evans, S. Hamilton, J. Jarrell, K.S. Kim, J. Lefebvre, R. Lefebvre, U. Mertzyurek, A. Thompson, M. Williams, "POLARIS: A New Two-Dimensional Lattice Physics Analysis Capability for the SCALE Code System," *Proc. PHYSOR 2014*, Kyoto, Japan, September 28 – October 3, 2014.

G. G. Davidson, T. M. Evans, J. J. Jarrell, S. P. Hamilton, T. M. Pandya, and R. N. Slaybaugh, "Massively Parallel, Three-Dimensional Transport Solutions for the k-Eigenvalue Problem," *Nucl. Sci. Eng.* **177**(2), 111-125, 2014.

J. J. Jarrell and D. A. White, "Centralized Used Fuel Resource for Information Exchange," *Proc. Waste Management 2014*, Phoenix, AZ, March 2-6, 2014.

W. Nutt, E. Morris, F. Puig, R. Howard, J. Jarrell, R. Joseph III, and T. Cotton, "Waste Management System Architecture Evaluations," *Proc. Waste Management 2014*, Phoenix, AZ, March 2-6, (2014).

J. J. Jarrell, A. T. Godfrey, T. M. Evans, and G. G. Davidson, "Full Core Reactor Analysis: Running Denovo on Jaguar," *Nucl. Sci. Eng.* **175**(3), 283-291, 2013.

J. J. Jarrell, T. M. Evans, and G. G. Davidson, "Discrete Ordinate Quadrature Selection for Reactor-based Eigenvalue Problems," *Proc. International Conference on Mathematics and Computational Methods Applied to Nuclear Science & Engineering (M&C 2013)*, Sun Valley, ID, May 5-9, 2013.

C. Baker, G. Davidson, T. M. Evans, S. Hamilton, J. Jarrell, and W. Joubert, "High Performance Radiation Transport Simulations on TITAN," *Proc. Supercomputing SC12*, Salt Lake City, NV, November 12-15, 2012.

J. J. Jarrell, A. T. Godfrey, T. M. Evans, and G. G. Davidson, "Full Core Reactor Analysis: Running Denovo on Jaguar," *Proc. PHYSOR 2012: Advances in Reactor Physics Linking Research, Industry, and Education*, Knoxville, TN, April 15-20, 2012.

J. J. Jarrell, R. E. Grove, and T. M. Evans, "A Cut-Cell Approach for 2D Cartesian Meshes that Preserves Orthogonal Grid Sweep Ordering," *Trans. Am. Nucl. Soc.* **105**, 435-437, Washington DC, October 30–November 3, 2011.

O. Lastres, D. Chandler, J. J. Jarrell, and G. I. Maldonado, "Plutonium-238 Production Studies at the High Flux Isotope Reactor," *Trans. Am. Nucl. Soc.* **104**, 716-718, Hollywood, FL, June 26-30, 2011.

J. J. Jarrell and M. L. Adams, "Discrete-Ordinates Quadrature Sets based on Linear Discontinuous Finite Elements," *Proc. International Conference on Mathematics, Computational Methods & Reactor Physics*, Rio de Janeiro, Brazil, May 8-12, 2011.

J. J. Jarrell, R. E. Grove, M. T. Shearer, and A. M. Watson, "Discrete Ordinate Mapping Algorithm for Region-Based Quadrature Sets," *Proc. International Conference on Mathematics, Computational Methods & Reactor Physics*, Saratoga Springs, NY, May 3-7, 2009.

J. J. Jarrell, M. L. Adams, and J. M. Risner, "Application of Quadruple Range Quadratures to Three-Dimensional Model Shielding Problems," *Nucl. Technol.* **168**(2), 424-430, 2009.

Other Publications

J. J. Jarrell, R. A. Joseph, R. L. Howard, G. Petersen, R. Cumberland, W. Nutt, J. Carter, T. Cotton, *Cost Implications of an Interim Storage Facility in the Waste Management System*, FCRD-NFST-2015-000648 Rev. 0, ORNL/TM-2015/18, January 30, 2015.

J. J. Jarrell, R. A. Joseph III, R. L. Howard, R. E. Hale, G. M. Petersen, R. B. Wilkerson, J. Fortner, E. Kalinina, *Initial Standardized Canister System Evaluation*, FCRD-NFST-2014-000084 Rev. 0, ORNL/LTR-2014/330, August 29, 2014.

J. Jarrell, R. Howard, R. Joseph III, J. Wagner, M. Nutt, M. Samsa, T. Cotton, E. Hardin, P. Swift, J. Carter, B. Gutherman, A. Levin, *Project Plan for an Assessment of Standardized Canister Systems*, FCRD-NFST-2014-000083 Rev. 1, May 02, 2014.

J. J. Jarrell and D. A. White, *Centralized Used Fuel Resource for Information Exchange (CURIE)*, FCRD-NFST-2013-000222, Oak Ridge National Laboratory, Oak Ridge, TN, September 2013.

R. L. Howard, R. A. Joseph III, J. J. Jarrell, and W. Nutt, *Preliminary Used Fuel Management System Concept of Operations Including Options for Standardized Transportation, Aging, and Disposal Canisters, and Direct Disposal of Dual Purpose Canisters*, FCRD-NFST-2013-000221, Oak Ridge National Laboratory, Oak Ridge, TN, July 2013.

Select Presentations

J. J. Jarrell, *Spent Nuclear Fuel: Myth vs. Reality*, Nuclear Science Week, Knoxville, TN, October 23, 2015.

J. J. Jarrell, *Standardized Transportation, Aging, and Disposal Canister Design*, Nuclear Waste Technical Review Board, Golden, CO, June 24, 2015.

J. J. Jarrell, *DOE-NE NFST Standardization Assessment*, NEI Standardization Brief, NEI Offices, Washington, D.C., July 16, 2014.

J. J. Jarrell, *Integrating Standardization into the Nuclear Waste Management System*, Nuclear Waste Technical Review Board, Washington, D.C., November 20, 2013.

J. J. Jarrell, *A Path Forward on Standardization*, DOE-NE Fuel Cycle Technologies Annual Review Meeting, Argonne National Laboratory, Lemont, IL, November 2013.

S. R. Johnson, W. Joubert, and J. J. Jarrell, *Enabling GPU and Multithreaded Concurrency in Denovo's Method of Characteristics Solver for Reactor Analysis and Nuclear Applications*, LDRD Presentations, Oak Ridge National Laboratory, Oak Ridge, TN, September 2013.

Students

- 2014 Supervised technical intern, Blake Wilkerson, University of Tennessee
- 2013 Supervised technical intern, Nick Hobbs, Georgia Institute of Technology
- 2012 Supervised summer technical intern, Mitch Young, University of Michigan